

# Interaktion

**INTERAKTION: Users Group for the Interak Computer.**

Newsletter Numbers 3 and 4 June and September 1983

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Editorial

Dear Member,

My name is Bob Eldridge and as of this issue I shall be editing the newsletter. Pete will still be around to help you but in a new role as Chairman of the users group. I will endeavour to assemble the IUGN from your submitted material which should be sent by post to me at :-

The Editor (IUGN)  
C/O 19 Ford Drive,  
Yarnfield,  
Nr Stone,  
STAFFS,  
ST15 0RP.

I have recieved a copy of the ZYBASIC manual. Presumably it is now available to all members/users of the system.

The last I heard is that the FDCI-1 card has been prototyped and will be soon in production.

Don't you think it is about time the small screen format VDU-K was replaced by something a little more sophisticated. I think the Interak deserves at least 80 by 26 text with pixel access. The pixel access is not so important, but the text size is absolutely essential. In order to do useful work with the computer 80 by 24 is the minimum required. This is obvious even to the designer of the VDU-K card, who, on his own system, uses an 80 by 24 display. -- If this system is to survive the next 5 years, replacement of the VDU-K should be an urgent priority.

We intend to start a contacts page where a member can place his name and address if he wishes to communicate with other members about any common interests. If you would like to take part in this please write giving your main topics of interest, and indicate your desire to be included in the page.

The newsletter, of any group sharing a common interest, is the forum for the members of that group. In this issue is a very readable article about modems. When you read this, consider what a network of Interak would be like all linked by modems. For example the newsletter could be broadcast. The problem is, how does one go about setting up such a network. If you know could you enlighten us, as the idea is quite fascinating.

Part 2 of the CP/M article will be published in the next issue.

Finally:- For your reference here are some guidelines for submissions. Members may submit anything for inclusion in this newsletter. Submissions will not normally be returned. Please keep a copy. Submissions should be typed or use block capitals if handwritten. Double spacing would be appreciated. The editors decision regarding publication is final. Copyright remains with the originator of the submitted material.

Bob Eldridge.

WHISPER SWEET BITS IN MY EAR  
By DAVE GORDON

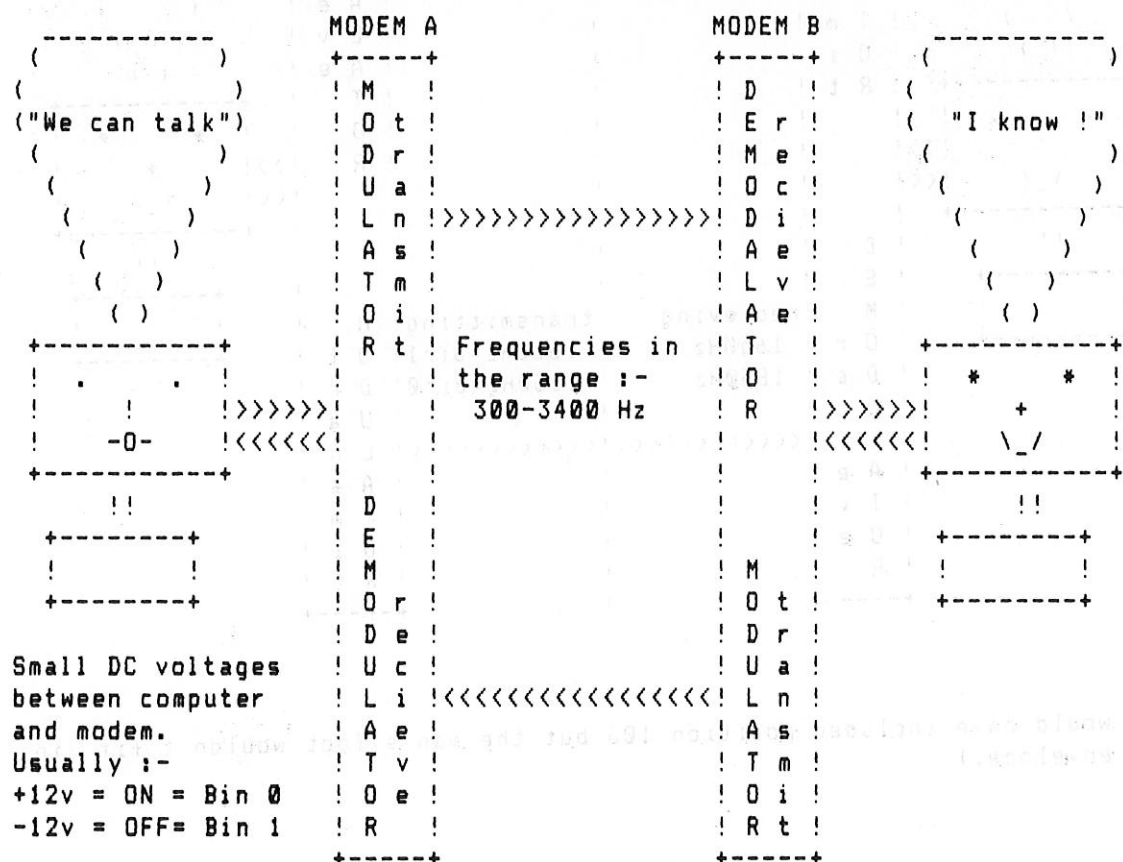
By DAVE GORDON

In the beginning there was a computer. And it was sad and lonely as it didn't have another computer to talk to. I've tried the 'Royal Mail' it thought, but it's too slow. So, as the only suitable medium for computers to talk to each other is the GPO (God's Poor Orphans) telephone network, some clever dick, (I don't know who, does anyone else?), invented a modem.

The word MODEM is derived from the words MODulate and DEModulate. (more on that later).

A modem can be likened to an interpreter. (You know - Parley vous francais - and all that). His sole purpose in life is to convert the signals which a computer can produce. (I.e Small D.C. voltages) into signals that may be transmitted over the telephone network. (I.e. Frequencies within the voice bandwidth).

As the voice bandwidth is 300-3400 Hz or cycles/sec, all the frequencies used by modems are within this range! At this point I will assume that you know that for a computer to talk to another or even itself it only needs to produce two signals, (It's binary), on or off, 1 or 0, mark or space. (Get the drift?). Therefore we come to this :-





	MODEM A (CALL)		MODEM B (CALL)	
{ ----- }	+-----+	I like	+-----+	{ ----- }
("I don't )	M transmitting	recieving!	D ("Neither do )	
( understand )	O t 980Hz=Bin1	1650Hz	E r ( "I" )	
( 980Hz )	D r 1180Hz=Bin0	1850Hz	M e ( )	
( 1180Hz" )	U a		O c ( )	
( )	L n >>>>>>>>>>>>>>>>>>>>>>		D i ( )	
( )	A s		A e ( )	
( )	T m		L v ( )	
( )	O i		A e ( )	
+-----+	R t		T	+-----+
.			O ! * *	
! >>			R >>  +	
/^\	<<<		<<<  /^\	
+-----+	D		+-----+	
!!	E I like		!!	
+-----+	M recieving	transmitting!	M	+-----+
! !	O r 1650Hz	980Hz=Bin1	O t ! !	
+-----+	D e 1850Hz	1180Hz=Bin0	D r	+-----+
	U c		U a	
	L i <<<<<<<<<<<<<<<<<<<<<<		L n	
	A e		A s	
	T v		T m	
	O e		O i	
	R		R t	
+-----+			+-----+	

As you can see above, apart from the clash of frequencies on the line. (i.e Both modems transmitting the same frequencies), the demodulators don't understand the frequencies coming in to them as they are expecting 1650Hz or 1850Hz. Therefore "No talkie".

This arrangement of 'CALL' and 'ANSWER' modems may be compared with male/female relationships. No reproduction is possible between members of the same sex. In this odd world of ours it is better to have a bisexual modem (i.e. You can choose between 'CALL' or 'ANSWER'). This means that whoever you want to talk to whether 'CALL' or 'ANSWER' can be accomodated. 'CALL' only modems are quite common but it is very unusual to find an 'ANSWER' only modem! Bisexual modems are probably the most common of all.

Also if after looking at my diagrams you think that modems are tall, they are not really! Not for their size, anyway.

The modems I have described can only be used for speeds up to 300 baud, use frequency modulation and are asynchronous. Asynchronous means that each character must have a start bit (always Bin 0) and a stop bit (always Bin 1). Also the computer software may use PARITY as a means of checking for errors in the character which has been transmitted. I will expand on the above if anyone wants me to. (ED- Yes please).

Finally. There are other forms of modulation, one being 'Phase Modulation', this too I can go into. (If I remember it?).

Au revoir.

THE END



THE AY-3-8910  
By MEL SAUNDERS

The Interak computer is (and it's been said before) a fairly straight forward computer in so much as it doesn't rely on any U.L.A's and the like. To date the only chip that may be giving some users problems is the AY-3-8910 sound chip and this only for folks who wish to add sound effects and audible prompts, etc.

I wonder if not knowing how to program the chip..... is why we don't see much software including sound or the reason there's not too many P.S.G cards around. But programming is easy once you know how! and is good fun.

The AY-3-8910 chip has 16 registers (mostly 8 bit) these control 3 sound channels, white noise, volume, envelope time and shape. In most cases the tone produced is the result of dividing the clock frequency by 16 then by the value in the registers(s).

SOUND REGISTERS		
COARSE TUNE (4bit) REGISTER	CHANNEL	FINE TUNE (8 bit) REGISTER
R1	A	R0
R3	B	R2
R5	C	R4

The contents of both the coarse tune and fine tune registers are added together to form a 12 bit value up to 4096 (with the coarse tune register(s) being the most significant nibble) The value in the registers is a PERIOD value! lower value higher tone and visa versa.

i.e.  $4\text{MHZ}/16/250 = 1000\text{HZ}$ .

$4\text{MHZ}/16/18 = 13.88\text{KHZ}$ .

$4\text{MHZ}/16/4096 = 61\text{HZ}$ .

The Noise register R6 works just the same but is only 5 bits wide meaning values up to 31 produce noise in the range of 8KHZ to 250KHZ (perhaps a little high but see later)

The enable register R7 gives the following control and is active "LOW". I.e. setting the bit will disable. Bits 0-2 will enable tone on channels A,B and C. Bits 3-5 will add noise onto channels A,B and C. Whilst bits 6 and 7 control I/O ports and need to be set high for output.

The amplitude registers R8-R10 (one for each channel A,B and C) are again 5 bits wide, setting any combination of the first four bits will set the volume to one of 16 fixed levels.

Setting bit 5 will put the volume control over to the envelope registers, and the sound level (volume) will follow the shape of the envelope (up/down etc).

The envelope period registers (R11 = coarse tune, R12 = fine tune) are both 8 bit and once again are added together (with R11 being the most significant byte) to form a 16 bit value up to 65535. NOTE: The clock is divided by 256 in the envelope registers and not by 16 as in the other registers.

I.e.  $4\text{MHZ}/256/65535 = 0.234\text{HZ}$ .

$4\text{MHZ}/256/16 = 976\text{HZ}$ .

$4\text{MHZ}/256/1 = 15.62\text{KHZ}$ .

Once again this is a PERIOD value and a high value will give you a long envelope time (low frequency), while a lower value gives you shorter times or higher frequencies.

The envelope shape/cycle register R13 is 4 bits wide.

The bits have the following functions ....

- Bit-0 HOLD If set this will limit the envelope to one cycle.
- Bit-1 ALTERNATE If set the envelope will change direction (up/down) at the end of each cycle.
- Bit-2 ATTACK If set the envelope counter will count up effecting an attack. If reset to '0' the counter counts down for a decay.
- Bit-3 CONTINUE If set the pattern will be as defined by the HOLD bit (bit-0 above). If reset to '0' the envelope counter will reset to zero after the cycle ends. It is possible to generate many waveforms by setting these bits in combination!

Lastly the I/O registers R14-15. These are of course 8 bits wide and can be read from and written to by using the IN(P) and OUT(P) commands. NOTE: Bits 6 and 7 of the enable register (R7) control these and are set low for input and high for output.

Now to programming. The Interak card contains two AY-3-8910 chips so producing two very different sounds at the same instant is no problem! Four port addresses are used, C0-C1 for the first chip and C2-C3 for the other.

The first address is used to latch the register number into the chip, the second enters data into that register.

Perhaps a sample program would help :-

```
10 REM EXPLOSION SOUND
20 FOR E=0 TO 13 :READ A
30 OUT £C0,E :OUT £C1,A (ed: the £ sign is hash for hex on our printer)
40 NEXT E
50 DATA 0,0,0,0,0,0,31,199,16,16,16,0,120,0
```

#### A FEW NOTES TO END

The chip manufacturers recommend a maximum clock of 2MHz and although it works fine at 4MHz, most of the frequencies produced are of little use for sound effects as they go up to 250KHz and you'll need very special ears for that!!

I have added a 74LS393 and switch and so have one AY-3-8910 chip with a clock range of 4MHz-250KHz providing tones down to 15Hz and envelope times lasting over a minute.

## HEX DUMP

## SPACE INVADERS by SIMON WALLER

Machine Code for VDU-2K with a 64 column 24 line screen

A classic arcade game simulation (killing aliens game)

use "&gt;" .or. "." to move right

&lt;" .or. "," to move left

Press space bar to fire

```
1000 CD 29 16 3E 02 32 79 16 AF 32 81 16 32 82 16 32
1010 87 16 21 9E 16 11 30 F0 01 0A 00 ED B0 21 40 F0
1020 22 88 16 21 C4 16 11 23 F0 01 07 00 ED B0 2A 88
1030 16 31 00 20 11 40 00 19 22 88 16 22 7A 16 11 BF
1040 01 19 22 7C 16 3A 87 16 3C 32 87 16 3A 79 16 3C
1050 FE 08 28 03 32 79 16 21 29 F0 34 3E 39 BE 30 04
1060 36 30 28 34 CD 4B 15 0E 04 3E 1C 11 80 00 2A 7A
1070 16 06 0F 77 23 36 20 23 10 F9 19 08 3E C0 A5 6F
1080 08 0D 20 ED 11 10 00 21 C6 F4 3E 03 0E 03 23 06
1090 05 36 0F 23 10 FB 19 0D 20 F5 3D 20 EF 3E 1D 32
10A0 67 16 3E FF 32 68 16 21 C4 F5 22 69 16 36 3E 2B
10B0 36 2B 2B 36 3C 21 00 00 22 83 16 21 6B 16 06 08
10C0 36 00 23 10 FB 21 50 90 22 73 16 06 14 21 8A 16
10D0 36 00 23 10 FB 3A 81 16 3C FE 0B 28 06 32 81 16
10E0 32 77 16 AF 32 76 16 32 78 16 32 85 16 CD 04 11
10F0 CD 99 13 CD F3 14 3A 78 16 CB 27 ED 44 C6 C0 32
1100 74 16 18 E9 F5 C5 D5 DD 21 73 16 DD 4E 01 DD
1110 46 00 CD 48 11 10 FB DD E5 C5 CD F8 13 CD F8 13
1120 CD EF 11 C1 DD E1 0D 20 E6 3A 67 16 57 3E 39 92
1130 32 67 16 2A 7A 16 01 00 02 ED B1 E2 43 11 2B 72
1140 23 18 F6 E1 D1 C1 F1 C9 CD 0E 16 C8 FE 03 CA 0B
1150 16 FE 20 28 2E E6 2F FE 2C 28 1A FE 2E C0 2A 69
1160 16 23 3E FE BD C8 22 69 16 36 3E 2B 36 2B 2B 36
1170 3C 2B 36 20 C9 2A 69 16 2B 3E C3 BD C8 23 36 20
1180 2B 18 E3 21 6B 16 C5 0E 00 06 04 7E 23 B6 23 2B
1190 01 0C 10 F7 21 86 16 79 C1 BE C8 3C 32 85 16 3A
11A0 82 16 3C 32 82 16 FD 21 6B 16 FD 7E 00 FD 23 FD
11B0 B6 00 FD 23 20 F4 2A 69 16 2B 11 40 00 B7 ED 52
11C0 FD 75 FE FD 74 FF 7E FE 1C 28 04 FE 1D 20 1D 3A
11D0 78 16 3C 32 78 16 CD 0A 15 3A 78 16 FE 3C CA 27
11E0 15 36 20 FD 36 FF 00 FD 36 FE 00 C9 36 5E C9 C5
11F0 3E 07 A1 C1 C0 3A 85 16 B7 CA B8 12 C5 06 04 FD
1200 21 6B 16 FD 6E 00 FD 66 01 7C B5 FD 23 FD 23 CA
1210 B3 12 7E 36 20 FE 20 28 4A FE 5E 28 46 FE 1C 28
1220 2E FE 1D 28 2A FE 24 20 7B DD 21 8A 16 DD 7E 00
1230 BD 20 16 DD 7E 01 BC 20 10 AF DD 77 00 DD 77 01
1240 3A 76 16 3D 32 76 16 18 5B DD 23 DD 23 18 DE 3A
1250 78 16 3C 32 78 16 CD 0A 15 3A 78 16 FE 3C CA 27
1260 15 18 41 11 40 00 B7 ED 52 FD 75 FE FD 74 FF 7C
1270 D6 F0 20 05 3E 40 95 30 2B 7E 36 5E FE 20 28 33
1280 36 20 FE 1E 28 04 FE 1F 20 93 2B 36 20 23 23 36
1290 20 21 00 00 22 83 16 AF 32 82 16 C5 06 0A CD 0A
12A0 15 10 FB C1 FD 36 FF 00 FD 36 FE 00 3A 85 16 3D
12B0 32 85 16 05 C2 03 12 C1 C5 3E 1F A1 C1 C2 70 13
12C0 C5 06 0A DD 21 8A 16 11 40 00 DD 66 01 DD 6E 00
12D0 7C B5 CA 67 13 7E FE 5E 28 52 FE 24 20 02 36 20
```



## HEX DUMP .. SPACE INVADERS cont ...

```
12E0 19 19 7C ED 52 FE F6 20 36 7E FE 20 28 20 3A 79
12F0 16 3D 32 79 16 CA F2 15 21 FD EF 11 05 00 19 3D
1300 20 FC C5 06 05 36 20 23 10 FB C1 CD 5F 15 DD 36
1310 01 00 DD 36 00 00 3A 76 16 3D 32 76 16 18 48 7E
1320 FE 5E 28 08 FE 0F 20 33 36 20 18 E2 DD 36 00 00
1330 DD 36 01 00 36 20 FD 21 68 16 FD 7E 00 FD 23 FD
1340 23 BD 20 F6 FD 7E FF BC 20 F0 FD 36 FE 00 FD 36
1350 FF 00 3A 76 16 3D 32 76 16 18 0C DD 74 01 DD 75
1360 00 FE 20 20 02 36 24 DD 23 DD 23 05 C2 CA 12 C1
1370 2A 83 16 7C B5 C8 3E 3F A1 C0 36 20 23 22 83 16
1380 36 1E 23 36 1F 3E 7F BD C0 36 20 2B 36 20 21 00
1390 00 22 83 16 AF 32 82 16 C9 F5 C5 D5 E5 3A 68 16
13A0 A7 28 2D 3E FF 32 68 16 3E 20 21 7F F0 11 40 00
13B0 06 16 BE 20 18 19 10 FA 2A 7C 16 2B ED 5B 7C 16
13C0 01 00 02 CD B7 14 18 2B CD 5B 14 18 D6 CD 5B 14
13D0 3E 00 32 68 16 3E 20 21 40 F0 11 40 00 06 16 BE
13E0 20 E6 19 10 FA 2A 7A 16 23 ED 5B 7A 16 01 00 02
13F0 CD 89 14 E1 D1 C1 F1 C9 F5 C5 D5 E5 DD E5 DD 21
1400 67 16 DD 7E 0F DD BE 10 28 4A 3C DD 77 0F 3A 78
1410 16 ED 44 C6 3C 47 04 ED 5F DD 86 0E B8 38 04 90
1420 3C 18 F9 32 75 16 5F DD 56 00 3E 39 92 2A 7A 16
1430 01 00 02 ED B1 E2 2D 14 1D 20 F8 2B DD 21 8A 16
1440 DD 5E 00 DD 23 DD 7E 00 DD 23 B3 20 F3 EB DD 73
1450 FE DD 72 FF DD E1 E1 D1 C1 F1 C9 21 40 00 ED 5B
1460 7C 16 19 22 7C 16 EB 3E FF 32 7E 16 01 00 02 CD
1470 B7 14 2A 7A 16 11 40 00 19 22 7A 16 2A 7F 16 11
1480 C0 F5 A7 ED 52 D2 F2 15 C9 FD 21 00 00 7E FE 1C
1490 28 04 FE 1D 20 05 12 36 20 FD 23 23 13 0B 78 B1
14A0 20 EB FD E5 C1 21 78 16 7E ED 44 C6 3C 91 C8 47
14B0 CD 0A 15 34 10 FA C9 FD 21 00 00 7E FE 1C 28 04
14C0 FE 1D 20 13 12 36 20 FD 23 3A 7E 16 B7 28 08 AF
14D0 32 7E 16 ED 53 7F 16 2B 18 0B 78 B1 20 DD FD E5
14E0 C1 21 78 16 7E ED 44 C6 3C 91 C8 47 CD 0A 15 34
14F0 10 FA C9 3A 82 16 FE 1E D8 AF 32 82 16 2A 83 16
1500 7C B5 C0 21 40 F0 22 83 16 C9 E5 D5 C5 F5 3A 87
1510 16 47 21 39 F0 3E 3A 34 BE 20 05 36 30 2B 18 F7
1520 10 F0 F1 C1 D1 E1 C9 21 A8 16 11 C0 F5 01 17 00
1530 ED B0 CD 0E 16 CB AF FE 4D 20 F7 21 40 F0 11 41
1540 F0 01 C0 05 36 20 ED B0 C3 2E 10 3A 79 16 3D C8
1550 11 02 F0 21 BF 16 01 05 00 ED B0 3D 20 F5 C9 F5
1560 C5 D5 E5 06 0A 21 8A 16 5E 36 00 23 56 36 00 23
1570 7A B3 28 08 1A FE 24 20 03 3E 20 12 10 EA 2A 69
1580 16 36 19 2B 36 2A 2B 36 19 11 40 00 A7 ED 52 3E
1590 20 BE 20 02 36 5C 23 BE 20 02 36 18 23 BE 20 02
15A0 36 2F 0E 04 06 00 CD 1C 16 0D 20 F8 3E 01 32 76
15B0 16 2A 69 16 36 3E 2B 36 2B 2B 36 3C 11 40 00 A7
15C0 ED 52 7E FE 5C 20 02 36 20 23 7E FE 18 20 02 36
15D0 20 23 7E FE 2F 20 02 36 20 E1 D1 C1 F1 C9 C5 D5
15E0 E5 21 00 F0 11 01 F0 01 00 06 36 20 ED B0 E1 D1
15F0 C1 C9 21 0E 17 11 C0 F5 01 0F 00 ED B0 CD 0E 16
1600 CB AF FE 59 CA 00 10 FE 4E 20 F2 C3 00 E0 16 00
1610 DB 40 C6 80 30 03 57 18 F7 7A B7 C9 11 01 00 21
```

## HEX DUMP ... SPACE INVADERS cont ...

```

1620 90 00 ED 52 30 FC 10 F7 C9 CD DE 15 21 CB 16 11
1630 8B F2 01 1B 00 ED B0 21 E6 16 11 8B F3 01 21 00
1640 ED B0 CD 0E 16 28 FB D6 31 38 F7 3C FE 04 30 F2
1650 32 86 16 21 07 17 11 70 F5 01 07 00 ED B0 CD 0E
1660 16 28 FB CD DE 15 C9 1C 00 E7 F5 A6 F2 66 F4 00
1670 00 00 00 50 86 1F 07 07 1D 00 40 F2 FF F3 00 FF
1680 F3 07 12 00 00 02 03 07 00 F2 A7 F4 F4 F3 72 F4
1690 33 F4 A8 F3 28 F4 A7 F5 00 00 00 00 00 53 63
16A0 6F 72 65 20 30 30 30 50 72 65 73 73 20 4D 20
16B0 66 6F 72 20 6E 65 78 74 20 77 61 76 65 20 20 20
16C0 3C 2B 3E 20 57 61 76 65 20 30 30 53 20 50 20 41
16D0 20 43 20 45 20 20 20 49 20 4E 20 56 20 41 20 44
16E0 20 45 20 52 20 53 45 6E 74 65 72 20 73 6B 69 6C
16F0 6C 20 6C 65 76 65 6C 20 31 2C 32 2C 33 20 20 28
1700 31 3D 68 61 72 64 29 52 65 61 64 79 20 3F 50 6C
1710 61 79 20 61 67 61 69 6E 20 3F 20 20 20 00 00 00

```

THE END

-----  
THIS by DAVE GORDON

For ZYBASIC with a 32 column by 24 line screen

```

(ED: Our printer prints f for the hash symbol)
2 CLS
10 PAGE :DOFF :LINE15 :?"DO YOU WANT INSTRUCTIONS (Y/N)
20 INK.11 :IF 11=f4E GOTO 30
25 IF 11=0 GOTO 20
26 GOSUB 4000
30 CLS
35 S1=0 :S2=0
50 A1=fF180
60 A2=fF19F
70 A3=fF2EB
80 A4=fF2F4
95 GOSUB 1000
90 A5=fF044+RND(23)
100 F1=0 :G1=0
110 PAGE :DOFF :LINE1 :?"FOR",S2, :?"AGAINST",S1
120 INK.Z1
130 IF Z1=f55 GOSUB 1000
140 IF Z1=f44 GOSUB 1500
145 IF N<>0 GOTO 155
150 IF Z1=f46N=N+1
155 IF N<>0 GOSUB 2000
156 IF N<>0 GOSUB 2000
157 IF N<>0 GOSUB 2000
158 IF S1>50 G1=1
159 IF G1=1 GOTO10
160 GOSUB 3000
180 IF F1=1 GOTO90

```

THIS cont .....

```

190 IF Z1=0 GOTO 120
999 GOTO 110
1000 IF A1=EF040 RETURN
1090 POKE A1,£20 :POKE A2,£20 :POKE A3,£20 :POKE A4,£20
1100 A1=A1-32 :A2=A2+32 :A3=A3-1 :A4=A4-1
1110 POKE A1,£1D :POKE A2,£1D :POKE A3,£0F :POKE A4,£0F
1499 RETURN
1500 IF A1=EF2C0 RETURN
1590 POKE A1,£20 :POKE A2,£20 :POKE A3,£20 :POKE A4,£20
1600 A1=A1+32 :A2=A2-32 :A3=A3+1 :A4=A4+1
1610 POKE A1,£1D :POKE A2,£1D :POKE A3,£0F :POKE A4,£0F
1999 RETURN
2000 IF N=1 B1=A1+1
2070 POKE B1+N-1,£20
2075 P1=PEEK(B1+N) :IF P1=£1D GOSUB 7000
2080 IF P1=£1C GOSUB 7500
2090 IF N>30 N=0
2095 IF N=0 RETURN
2115 POKE B1+N,£3E
2120 N=N+1
2499 RETURN
3000 GOTO 3010
3010 POKE A5-32,£20
3090 IF A5>EF2DF F1=1
3095 IF F1=1 GOSUB 5000
3100 IF F1=1 RETURN
3120 POKE A5,£1C
3130 A5=A5+32
3499 RETURN
4000 CLS
4100 LINE1 :?"ITS A COP OUT GAMES PRESENTS"
4110 ?:"THIS !!!!!!"
4115 ?:"YOU ARE THE MAN ON THE LEFT":?
4120 ?:"U=UP D=DOWN F=FIRE":?
4130 ?:"THINGIES WILL COME FLOATING DOWN IT IS BEST TO SHOOT THEM":?
4140 ?:"ALTERNATIVELY DONT LET THEM GET BETWEEN YOUR GOALPOSTS AS THEY
GET MORE POINTS" :?
4145 ?:"AS YOU MOVE YOUR GOALPOSTS AND YOUR MIRROR IMAGE FOLLOW":?
4150 ?:"P.S. DONT SHOOT YOUR MIRROR IMAGE ON THE OTHER SIDE"
4170 ?:"IF THE THINGIES GET MORE THAN 50 POINTS THEN GAME OVER"
4180 ? :?"PRESS ANY KEY TO CONTINUE"
4900 INK.12
4990 IF I2=0 GOTO 4900
4999 RETURN
5000 S1=S1+1
5010 IF A5>A3 GOTO 5050
5030 RETURN
5050 IF A5<A4 S1=S1+4
5070 RETURN
7000 PAGE :DOFF :LINE2 :?"YOU HAVE JUST SHOT YOURSELF GAME OVER"
7010 G1=1
7020 S1=S1+100
7030 N=0

```

THIS cont .....

```

7499 RETURN
7500 GOTO 7590
7590 POKE B1+N,£2A
7600 FOR V=1 TO 100 :NEXT V
7610 POKE B1+N,£20
7620 N=0
7630 S2=S2+5
7640 F1=1
7999 RETURN

```

THE END

### SPACEHUNT by MEL SAUNDERS

For XTAL BASIC with a 32 column 24 line screen  
A searching for aliens game

```

10 REM *****
20 REM *      SPACEHUNT      *
30 REM *  MEL SAUNDERS 6/84  *
40 REM *****
50 REM
60 CLS :PRINT
70 PRINT"*****SPACE HUNT*****" :PRINT
80 PRINT"In this game you will be shown your long range radar scanner
this will show whatever may be before you..." :PRINT
90 PRINT" but hidden somewhere is a XTAL spacecraft loaded with deadly
space torpedos! you MUST find and destroy him"
100 PRINT :PRINT" too find him you will have to enter sector
coordinates into your onboard computer"
110 PRINT :PRINT" when your photon laser will be aimed and fired at
this sector but be very carefull you only have power for 10";
120 PRINT" blast"
130 PRINT @5,22," press SPACE to play"
140 Z$=INCH$ :IF Z$=" " THEN 160 ELSE 140
150 REM :SET-UP DISPLAY
160 CLS :X=RND(54)+6 :Y=RND(31)+12
165 ZZ=RND(54)+6 :QQ=RND(31)+12
170 FOR Z=&F004 TO &F01E :POKE Z,&19 :NEXT Z
171 POKE &F003,&35 :POKE &F010,&58 :POKE &F01D,&36,&30
180 FOR T=&F022 TO &F03E
190 POKE T,&16 :NEXT T
200 FOR Q=&F042 TO &F23E STEP 32
210 POKE Q,&14 :POKE Q+29,&15 :POKE Q-1,&18
220 POKE Q+RND((25)+2),&2A :POKE Q+RND(25)+2,&2E
230 POKE &F220,&31,&30 :POKE &F040,&34,&30 :POKE &F121,&59
240 NEXT Q
250 FOR T=&F242 TO &F25E :POKE T,&17 :NEXT T
260 POKE &F022,&13 :POKE &F03F,&12 :POKE &F242,&11 :POKE &F25F,&10
270 IOM4,0 :IOM5,0

```

SPACEHUNT cont ....

```
280 S=RND(10)+1
290 FOR R=10 TO 1 STEP-1
295 PRINT @18,22,"LASERS :";R;" :";R*S
300 PRINT @0,20,":INPUT"ENTER X SECTOR ";XX
310 IF XX=X THEN GOSUB 670
320 IF XX=X AND YY=Y THEN GOTO 860
360 IF XX=X THEN B$=""
370 IF XX>X THEN B$="WEST"
380 IF XX<X THEN B$="EAST"
390 PRINT @14,20,"
400 PRINT @0,20,":INPUT"ENTER Y SECTOR ";YY
410 REM :SOUND FOR LASER FIRE
420 RESTORE 460
430 FOR Q=0 TO 13
440 READ A :OUT &C0,Q :OUT &C1,A
450 NEXT Q
460 DATA 0,0,0,0,0,0,12,7,16,16,16,16,25,15
470 PP=POINT(ZZ,QQ) :IF PP=1 THEN 1030
480 IF YY=Y THEN GOSUB 770
520 IF YY=Y THEN A$=""
530 IF YY>Y THEN A$="SOUTH "
540 IF YY<Y THEN A$="NORTH "
550 PRINT @14,20," "
560 XX=XX+1 :YY=YY+2
570 C$=A$+B$
580 REM :DISPLAY PIXAL SETTING
590 SET XX,YY
600 XX=XX-1 :YY=YY-2
610 PRINT @0,"2,"
620 PRINT @0,22,"TRY "C$
630 IF XX=X AND YY=Y THEN GOTO 860
635 PRINT @29,22," "
640 NEXT R
650 GOTO 1040
660 REM :DEAL WITH CORRECT X
670 PRINT @18,20,"X :SECTOR : "X
680 RESTORE 720
690 FOR T=0 TO 13 :READ C
700 OUT &C0,T :OUT &C1,C
710 NEXT T
720 DATA 250,0,0,0,0,0,0,254,16,0,0,0,10,12
730 FOR D=1 TO 200 :NEXT D
740 FOR T=0 TO 13 :OUT &C0,T :OUT &C1,0 :NEXT T
750 RETURN
760 REM :DEAL WITH CORRECT Y
770 PRINT @18,21,"Y :SECTOR : "Y
780 RESTORE 820
790 FOR T=0 TO 13 :READ C
800 OUT &C0,T :OUT &C1,C
810 NEXT T
820 DATA 250,0,0,0,0,0,0,254,16,0,0,0,10,12
830 FOR D=1 TO 200 :NEXT D
840 FOR T=0 TO 13 :OUT &C0,T :OUT &C1,0 :NEXT T
```



SPACEHUNT cont ....

```
850 RETURN
860 CLS
870 RESTORE 930
880 REM :SOUND FOR HIT,ECT
890 FOR T=0 TO 13 :READ D
900 OUT &C0,T :OUT &C1,D
910 OUT &C2,T :OUT &C3,D
920 NEXT T
93 DATA 0,0,0,0,0,0,31,7,16,16,16,0,100,0
940 FOR Q=1 TO 20 :PRINT @6,12,"SUCCESS YOU GOT HIM!"
941 FOR H=1 TO 50 :NEXT H
950 Z=RND(768)+&F000 :POKE Z, &2A
960 PRINT @3,12,"
961 FOR H=1 TO 35
962 NEXT H
963 NEXT Q
970 PRINT @6,12,"SUCCESS YOU GOT HIM!"
980 PRINT @4,5,"YOUR SKILL LEVEL "(R*R*123)+R
990 PRINT @3,20,"WANT ANOTHER GAME Y/N"
1000 W$=INCH$ :IF W$="Y" THEN 160 ELSE 1010
1010 CLS :PRINT @8,12," OK BACK TO BASE!"
1020 END
1030 REM :SOUND FOR LOST GAME,ECT
1040 CLS :FOR T=1 TO 5 :RESTORE 1100
1050 FOR Q=0 TO 13 :READ E
1060 OUT &C0,Q :OUT &C1,E
1070 OUT &C2,Q :OUT &C3,E
1075 OUT &C0,12 :OUT &C1,250
1080 NEXT Q
1090 FOR W=1 TO RND(300) :NEXT W,T
1100 DATA 0,0,0,0,0,0,31,7,16,16,16,0,120,0
1110 PRINT @0,12," TOO SLOW HE GOT YOU THIS TIME
                                SKILL LEVEL "S*S-S*S*S
1120 PRINT @3,22,"PLAY AGAIN?"
1121 Z$=INCH$
1122 IF Z$="Y" THEN 160 ELSE 1010
```

THE END

COMPETITION NOTES

In order to encourage users to send in to the Interaktion User Group examples of software they have written, developed, or implemented for the Interak Computer, a small prize has been offered by Greenbank Electronics. (The work need not be original or unpublished, but don't send in anything which will result in your going to gaol!)

Up to one prize a month will be offered, until further notice, and each will be an Interak Bare Board. In the absence of entries of sufficient merit (as judged by Greenbank Electronics) the prize will not be awarded, and exceptionally more than one prize per month will be given.

Conditions:

1. The prizewinners must be published in the Interaktion Newsletter.
2. The software must be made available for distribution to other users, at a price to be agreed, or preferably simply for the cost of distribution.
3. The prize can be exchanged for another board by an Interak supplier, at the supplier's option; it cannot be exchanged for goods or credit. (It can of course be sold or given away.)

David Parkins

INTERAKTION BOOK LIBRARY

This section is to give members access to a wide range of books on computing and electronics. The only cost to the member is that of postage. Books may be borrowed for up to 3 weeks, and are available from the User Group address. Member Dick Bowyer is acting as librarian for now. At present the books available are:

LANGUAGE BOOKS

TRS 80 Assembly Language Programming .....	Radio Shack
Z80 Assembly Language Programming Manual .....	Zilog
A Course in Basic Programming .....	Sinclair
Making the Most of your ZX 80 .....	Tim Hartnell
30 Hour Basic .....	C.Prigmore
Basic for Home Computers a Self-Teaching Guide .....	B.Albrecht, L.Finkel & J.Brown
Course in Standard Coral 66 .....	J.D.Halliwel & T.A Edwards
Simple Pascal .....	J.McGregor & A.Watt
Lecture Notes in Computer Science	
Pascal User Manual and Report .....	K.Jensen & N.Wirth

# DATA BOOKS

Mostek 1982/1983 Microelectronic  
Data Book (memory/CPU/Peripherals) ..... Mostek  
Memory Data Book and Designers Guide  
1980 ..... Mostek  
Bytewyde Memory Data Book 1981 ..... Mostek  
National Semiconductor Memory  
Data Book 1980 ..... National  
National Semiconductor Interface  
Data Book 1980 ..... National  
TTL Data Book ..... National  
The European Selection  
(memory/interface/linear) ..... Motorola

# GENERAL & ELECTRONICS

Computer Technology for Technicians  
and Technical Engineers Vol. 1 ..... R. Watkin  
Electronic Computers Made Simple ..... H. Jacobowitz  
Test Instruments for Electronics  
(how to build test instruments) ..... M. Clifford  
Practical Test Instruments  
You Can Build ..... W. Green  
How to Troubleshoot & Repair  
Electronic Test Equipment ..... M. Horowitz  
Computers and the Social Sciences ..... A. Brier & I. Robinson

# MANUALS etc.

Epson MX-80 Type II Operation Manual .. Epson  
Newbury 8000 Series VDU Terminal  
Operator Instruction Manual ..... Newbury Labs  
Electronics Projects Index  
(A descriptive guide to 2500 projects  
published in popular magazines.  
Quite old now.) ..... Polytechnic  
Why Do You Need a Personal Computer? .. Leventhal & Straffars  
Computer Programming in the Classroom . B.J.Jackson  
TABS Accounting Business Systems  
User Guide Vol 1 ..... TABS  
Easy Add-on Projects for Spectrum,  
ZX-81, Jupiter Ace ..... Owen Bishop  
6502 Games ..... Rodney Zaks

All books have been donated by users (a lot from Greenbank). If you  
have any books etc. surplus to requirements please let me have them.

Richard Bowyer

## SOFTWARE LIBRARY

(Please enquire for cost of postage, and items marked POA)

NAME	DESCRIPTION	AUTHOR	CODE	SUPP.	SCREEN	COST
ZYMON 2	INTERAK monitor	BE	MC	GB	A	GB
ZYBASIC 2	INTERAK BASIC	NK	MC	GB	A	GB
ZYMON 2	INTERAK monitor	BE	MC	UG	C	POA
ZYBASIC 2	INTERAK BASIC	NK	MC	UG	C	POA
XTAL BASIC	14K BASIC	XL	MC	UG	A	£40
XTAL BASIC	14K BASIC	XL	MC	UG	C	£40
FIGFORTH	Forth Compiler	CD	MC	UG	A	£15
FIGFORTH	Forth Compiler	CD	MC	UG	C	£15
ASM 32	Editor Assembler	NK	MC	UG	A	£10
ASM 64	Editor Assembler	NK	MC	UG	C	£10
HC DISASS	Simple Disassembler	HC	MC	UG	A	£ 3
REVAS	Better Disassembler	DP	MC	UG	A	POA
MEGABUG	Debug/Training Package	RO	MC	UG	C	£13
VELTEXT	Text Editor	PV	MC	UG	A	£ 5
VELTEXT	Text Editor	PV	MC	UG	C	£ 5
Lander	Lander Game	PV	XL	UG	C	\
Towers	Towers Puzzle	PV	XL	UG	C	PP
Crazy Maze	"3D" Maze Game	PV	XL	UG	C	/
Avalanche	Blob Dodging Game	DB	ZB2	UG	A	PP
Monster Mash	Maze Game	BE	ZB2	UG	A	PP
Graph	Graph Plotter	MC	ZB2	UG	A	PP
Rakovsky	Computer Chess (6 levls)	BE	MC	UG	A	\
AC10.XX	(Chess Character EPROM for VDU-K) -	BE	NA	UG	A	/
Rakovsky	Computer Chess (6 levls)	BE	MC	UG	C	\
AC10.XX	(Chess Character EPROM for VDU-2K) -	BE	NA	UG	C	/
Happy Sums	Fun maths	PV	ZB2	UG	A	PP
Hangman	Spelling game	PV	ZB2	UG	A	PP
0's and X's	Game	PV	ZB2	UG	A	PP
Pools Pick	Random Draw Selector	PV	ZB2	UG	A	PP
Count	Learn to count	PV	ZB2	UG	A	PP
Dice Pontoon	Simple Game	PV	ZB2	UG	A	PP

Key: MC machine code. Screen: A 32 x 24 VDU-K  
 ZB2 ZYBASIC. B 64 x 16 VDU-1K  
 XL XTAL BASIC. C 64 x 24 VDU-2K  
 GB Greenbank.  
 UG User Group.  
 PP Postage & Packing.  
 POA Please enquire (Price on Application).

Orders and enquiries to Interaktion User's Group  
 Pete Vella,  
 19 Ford Drive,  
 Yarnfield,  
 Nr Stone,  
 STAFFS ST15 0RP.

# LETTERS TO THE EDITOR

Please write with comments, ideas, complaints and suggestions. Name and address must be enclosed. Responsibility for views and comments expressed cannot be held by the editor as members letters are published with as few changes possible.

Dear Ed,

I hope you don't mind me writing to you direct as you know poor Pete Vella is up to his neck in it (WHAT- is that what it is UGGG!!). First things first many thanks to David Parkins who unfaillingly has given me lots of help and advice!

HINTS AND TIPS- One of the first mods I did was to change the Halt LED (MZB-3) to a run LED simply by changing Q2 for a NPN type say a 2N3704 also reverse emitter-collector leads.

When I built the P.S.G card. I added a 74S393 to the card. I used this to provide one of the AY-3-8910's with a range of low clock frequencys, as 4MHZ is really too high (most frequencys too high to hear, up to 125KHZ). Also the reset circuit needed a bit of a mod, could'nt use both resets, local was fine but sometimes at switch on the sound card produced noise, but system reset meant doing a system reset every time a sound program went wrong. (Yes I know programs shouldn't go wrong). For those of you with a P.S.G proceed as follows :-

Find 74LS132 chip and reset circuitry, wire NRST/A21 to pin-1 of this IC, break link from pin-2 to pin-5 and pin-13, lastly tie these two pins to 5 volts. If all is well both resets should now be useable. Lastly I wonder how many members would build a P.S.G. or even a P.C.G. if they knew how to program it. In other words is it the programming that is holding them back, these cards are great fun to use and now we? have the software too!

I have just done your 64 column mod quite right first time.

I found INTERAKTION 3+4 very interesting especially Pete's ASM 32 (64) as I am not so bright on machine code (in fact pretty useless and this will help a lot.)

Like Chris Davies I had tape recorder problems with ZYBASIC at 1200 baud but when I changed to XTAL BASIC I could only manage 300 baud. But I got a Philips D6340 at £24 and I now work at 2400 baud with 99.99% success.

May I thro Interaktion mention I would like to get a few tape groups going, where members have a chat on a common tape (say 3 members 20 minutes each on a C60 tape) so would be very keen to hear from anyone interested.

As this is only the second letter I have written with Veltex I will end here and hope I can print it OK!!

MEL SAUNDERS, 7 DRUMCLIFF ROAD, THURNBY LODGE, LEICESTER, LE5 2LH.



Dear Ed,

Just a few lines to relay a little bit of information re the DUAL/TAPE interface.

It would appear that the relay drive transistors can still be conducting sufficient current to make unlatching of Relays 1 and 2 difficult. I have experienced at random intervals, the situation whereby sufficient contact relay current via the tape recorder I use plus what must be a small leakage current of Q2/Q3 will result in the Reeds maintaining contact. This is probably caused by VOH of U17 not quite high enough to shut off Q2/Q3. Indeed, replacing R37 and R40 with 2K2 resistors resolved the problem quite nicely.

A more serious problem revolving around the same subject has resulted since I have incorporated programs using CRYSTAL BASIC. This manifests itself as momentary relay operation during a save or load sequence. It appears that the save/load routine feeds data to or from tape in "blocks". After each block the relay LED's will flash and the relays de-energise momentarily. Fortunately the response time of the tape recorder is long enough to ignore this most times, however at the end of a file save the relay off time is long enough to cause the tape recorder to actually reduce record speed. This has on one occasion corrupted the 'end of file' data, causing a lot of hair tearing! Fortunately I recovered the file by inserting an 'ON ERROR GOTO' into the tape file sequence. I'm quite sure an elegant software correction will probably be able to fix this but in the meantime I have jury rigged a delay to the relay circuit to inhibit the relay de-energisation. This also ensures the relay shuts off by virtue of the additional drop across the diode.

Hoping this might be a useful contribution and would be interested in any response to correct the problem by software.

MAX COTTRELL, 98 MANCHESTER ROAD, SOUTHPORT, MERSEYSIDE, PR9 9BJ.

